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AREA DENIAL DEVICE**FIELD OF THE INVENTION**

The present invention relates to defense means, particularly to the field of non-lethal area denial devices, and to non-lethal devices for disabling, RFID tagging and marking enemy personnel, vehicles and robots. The present invention relates to devices such as land mines and other area denial devices that, after deployment, are armed or arm themselves through the action of an integrated component, and later are disarmed or disarm themselves through a similar process.

SUMMARY OF THE INVENTION

The following description of preferred embodiments will provide a summary description of the present invention.

Explosive anti-personnel landmines cause thousands of deaths and severe, life limiting injuries amongst insurgents and civilians every year. It is estimated that over 20,000 civilians, including many children, are permanently maimed or killed a year by anti-personnel landmines. As a result of wide-spread international concern about the high number of civilian injuries and deaths from these mines, there is general agreement among many Governments that it is necessary to restrict and eliminate these weapons. This has resulted in an international treaty known as the Ottawa Convention to ban explosive Anti-Personnel Landmines.

The United States is not at this time a signatory party to this treaty, and the United States military and most other military forces see the continuing need to deny enemy access to areas or to delay access until troops can occupy and mount defenses. The United States has maintained that United States anti-personnel mines are not the cause of civilian casualties since the anti-personnel mines in United States mine systems are intended to self-destruct during or shortly after combat.

The need for anti-personnel landmines will never go away. It is highly desirable to deny an enemy access to an area during battle. It is also highly desirable to deny access to approaches to camps and fortifications, both on a long and short-term basis. With an explosive anti-personnel landmine, the possibility of civilian injury and death is very high. The possibility of accidental injury or death to friendly forces is also high, both in the deployment and recovery of the landmine.

With the present invention landmine replacements can be deployed that are non-lethal yet pose a serious threat of injury and provide a strong deterrent to enemy personnel entering the area. These lance mines will cause a painful and temporally disabling injury, and provide options for tagging enemy personnel for identification. These lance mines provide for the use of electrical, chemical and biological means to have a further deterrent on the enemy personnel as desired.

The present invention provides a lance mine that will cause a non-lethal injury to enemy personnel by means of a spike penetrator that will pierce the body at the point of contact. The lance mine does not accomplish its deterrent action by exploding, but by driving a spike penetrator into the insurgent's foot. The spike penetrator will cause severe pain at the point of entry, but will not penetrate far enough to be life threatening. Further, the spike penetrator can be facilitated with an identification device, such as a Radio Frequency Identification Device, known generally as an RFID chip, that is inserted into the body of the enemy personnel and remains in the body of the enemy personnel even if the enemy personnel pulls the spike penetrator out. Other identification devices include those comprised of metal, magnetic material,

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radioactive material, biologicals, chemicals, drugs, paper, plastic, ceramic, glass, wood, or organic materials.

The spike penetrator is shaped and surfaced such that it will make ready entry into the body, and resist attempts to remove it by simply pulling or tugging. The spike penetrator may be ribbed or roughened, or barbed, or may have a shaped surface that requires expansion of the wound to facilitate removal. The spike penetrator may also be shaped as a screw. Any attempt to remove it could be easily complicated by making the shape a left hand screw, such that when an uninformed person attempts to remove the screw shaped penetrator the right hand turning action will simply drive the spike penetrator deeper into the foot of the enemy personnel. Spike penetrators that are thus shaped will discourage casual attempts at removal, and specialized tools for removal may be provided to authorities to encourage the enemy personnel to quickly surrender and seek medical attention.

The spike penetrator may also be equipped with an adhesive surface such that upon entry it rapidly 'glues' itself in place, forming a bond with the flesh of the enemy personnel and denying easy removal. For example, a fast acting cyanoacrylate coating on the spike penetrator would cause the spike penetrator to seal itself into the wound, eliminating the possibility of blood loss and reducing the possibility of removing the spike penetrator without medical attention. Any inserted RFID chip could be so equipped to prevent non-professional removal.

The lance mine will be relatively silent in its operation as the spike penetrator is directly impacting and penetrating the boot, and the expanding gas noise is muffled by the boot standing directly on top of the lance mine.

Chemicals such as irritating and inflammatory agents may be attached to or embedded as an integral part of the spike penetrator. Agents such as pepper derivatives (Oleoresin Capsicum and related compounds), alcohols, ketones, solvents, oils, mustards, halogenated organic compounds, metals, organics, inorganics, minerals, cyanoacrylates, and histamine producing or initiating compounds may be used to increase the discomfort level and encourage the enemy personnel to seek immediate medical attention.

Thermal agents may be incorporated that rapidly increase the temperature of the spike penetrator, and in this manner will encourage the enemy personnel to immediately cease battle activities. A pyrotechnic whistle or small explosive report may be incorporated in the lance mine or spike penetrator to alert friendly personnel to the proximity of a triggered lance mine.

Electrical agents, such as a battery powered device providing electrical shock, or a mechanical vibrator providing mechanical stimulation, may be integrated into the lance mine and spike penetrator to facilitate inhibitory action against the enemy personnel.

Drugs such as sedatives, tranquilizers or other inhibiting or stimulating medications may be incorporated for spike penetrator delivery. In this manner, the enemy personnel are disabled for ready apprehension.

Dyes, drugs or biological agents may be introduced that dye the skin of the enemy personnel for ready identification. As these dyeing agents are internal and systemic, they will be impossible to simply wash off as with externally applied agents. In the case where the penetrator is targeted against enemy personnel wearing shoes or boots, the penetrator may be so contrived as to penetrate the shoe and foot with a final mechanical stop, such as a nail or screw head, to stop the penetrator from passing completely through the shoe and therefore attaching or fastening the shoe to the foot.